

## HIGH TEMPERATURE NANOCOMPOSITE AND METHOD OF MAKING

**[0045]** A multiphase ceramic composite that retains nanostructural characteristics up to high temperatures. The ceramic composite comprises a mesoporous matrix and a plurality of crystalline inorganic nanoparticles, each of which having at least one dimension of less than about 100 nm, disposed throughout the mesoporous matrix. The mesoporous matrix comprises a ceramic matrix and a plurality of pores dispersed throughout the ceramic matrix and forming a mesoporous network. In one embodiment, the ceramic composite is thermally and structurally stable - i.e., it does not undergo any decomposition or melting - up to about 1000°C. Methods of making a ceramic composite and a ceramic composite article having such a mesoporous matrix are also disclosed.